

November 30, 1854.

ANNIVERSARY MEETING.

The EARL of ROSSE, President, in the Chair.

Mr. Paget, on the part of the Auditors of the Treasurer's Accounts, announced that the total receipts during the past year, including a balance of £1006 17s. 7d. carried from the account of the preceding year, amounted to £4252 12s. 0d., and that the total expenditure, including an investment of £800 in the Funds, was £3208 12s. 3d., leaving a balance in the hands of the Treasurer of £1043 19s. 9d.

The thanks of the Society were voted to the Treasurer and Auditors.

List of Fellows deceased since the last Anniversary.

On the Home List.

His Majesty, Frederick, King of Saxony.

James Andrew, LL.D.	John Harwood, M.D.
Golding Bird, M.D.	Charles Hoare, Esq.
William Blake, Esq.	Sir Everard Home, Bart.
William Brockedon, Esq.	Robert Jameson, Esq.
Captain Crozier, R.N.	Sir Richard Jenkins.
William, Earl of Dartmouth.	John Augustus Lloyd, Esq.
Hart Davis, Esq.	Lieut.-Col. Mudge.
Thomas, Lord Denman.	George Newport, Esq.
General Sir Benjamin D'Urban.	George Roupell, M.D.
Edward Forbes, Esq.	Charles Stokes, Esq.
Admiral Sir John Franklin.	George Townley, Esq.
John Davies Gilbert, Esq.	Charles Baring Wall, Esq.
Rev. Samuel Gardiner.	Nathaniel Wallich, M.D.
Henry Harvey, Esq.	Alexander Wollaston, Esq.

On the Foreign List.

Baron Von Lindenau.
Macédonie Melloni.

| Charles François Brisseau Mirbel.

Withdrawn.

Captain Chapman, R.A.

Defaulters.

E. B. Beaumont.

| E. W. Tuson.

List of Fellows elected since the last Anniversary.

George James Allman, M.D.

| John Bennet Lawes, Esq.

William Bingham Baring, Lord
Ashburton.

| Robert Mallet, Esq.

| Charles May, Esq.

Edward William Brayley, Esq.

| Capt. Thomas E. L. Moore, R.N.

Alexander Bryson, M.D.

| Captain Richard Strachey.

J. Lockhart Clarke, Esq.

| Robert Dundas Thomson, M.D.

Joseph Dickinson, M.D.

| Samuel Charles Whitbread, Esq.

Ronald Campbell Gunn, Esq.

| Wm. Crawford Williamson, Esq.

Robert Hunt, Esq.

The President then addressed the Society as follows :—

GENTLEMEN,

WHEN we met last November, I ventured to remark that the objects of science were better understood than they had been formerly, and that accurate notions on scientific subjects were becoming more prevalent : the progress in that direction has still continued, and during the last year it has been even more decided than before.

With the spread of knowledge, the great body of the community are now better enabled to appreciate the importance of science in promoting the moral and physical improvement of mankind ; there is consequently a growing desire that science should be advanced, and as that object has been best effected by scientific societies, they are regarded with more interest. Public opinion having taken that direction decidedly, it was not unreasonable to expect that Government would feel anxious to meet the wishes of the scientific bodies, and provide them with a building where they would be enabled to

employ to the best advantage the machinery of association, which had already effected so much. It is probable, therefore, that before very long you will have the important question to decide,—whether to retain your present apartments, or to accept a suitable place in a new building. Throughout all the communications with the Government, your officers have taken especial care to be perfectly explicit on two points : one, that till the plans were prepared, any final decision on your part was impossible ; the other, that you had a free option to retain your present apartments should you think fit, having received them as a grant, to endure so long as the Society should exist. There can now, I think, be little doubt but that the leading Scientific Societies will be suitably provided for, and that you will have the opportunity of taking your proper place at the head of science, with the other Societies by your side.

The pursuit of science will thus be greatly facilitated ; it will be rendered more convenient, and therefore more attractive ; and many will devote themselves to it who perhaps otherwise would not have entered upon it at all.

While, however, the Government is wisely anxious to encourage the active pursuit of science by meeting the wishes of the great body of scientific men, we perhaps may have it in our power to effect something in the same direction.

From various observations of my late lamented predecessor in his Addresses, it was evidently his opinion that we should act wisely in shaping our rules so as to adapt them to the varying usages of society, rather than to preserve everything unchanged, relying on the sanction of a long prescription. In former times, November was the height of the London season, and the Anniversary, with all its preliminary business, was naturally held then, because the largest number of Fellows were in town. Whether for the better or not, the season has been changed, and it is now six months later ; we, however, remain where we were. The Council meets the latter end of October, and continues its meetings through November ; the principal business being to award the medals, and to select the Officers and Council to be recommended to the Society at large for election. The November business is wound up by the Anniversary, the most important meeting of the Society. The Fellows who are not permanent residents in London are naturally absent in the

country : the great business of the year, with all its responsibilities, devolves therefore upon a section of the Society. A country gentleman, if named upon the Council, cannot conveniently attend in November, and but few country gentlemen attend the anniversary*. Our proceedings are therefore not of as much interest to the Fellows taken as a whole as they might be made to be, and they are not calculated to attract the men who, having attained high scientific distinction at the Universities, reside in the country, unharassed by professional calls, and who have therefore both training and leisure, important elements of success in all scientific pursuits.

The award of the medals at a time when so many Fellows are absent is also attended with inconvenience ; for although an attempt is made to secure for each science a kind of representation in the Council, still so wide is the range of science now, that special departments are often necessarily unrepresented. In disposing of papers, the imperfect representation of individual sciences is unattended with inconvenience, because each paper is referred to two Fellows to report upon ; the Council thus calls the whole Society to its aid, and the result, I believe, is perfectly satisfactory. With the medals it is otherwise ; no official reference is made to Fellows not on the Council. There is a further difficulty. The questions which usually arise are of this nature. Discoveries have been made by different individuals in various sciences. Who has added most to the general stock of knowledge by a positive contribution ? Who has the merit of having effected discoveries of most promise ? Recollect, that in answering these questions some estimate must be made of the weight due to each science, for they cannot be considered all alike ; very far from it. Some sciences require great mental labour, guided by faculties of a very high order,—a rare gift ; while other sciences can be cultivated successfully by common-place men, with only a moderate amount of perseverance. That such an estimate can be made, and which carries with it a kind of general assent, is evidenced by the fact that it is annually made, to some extent, at the examination for the Fellowship in the University of Dublin, which bears a certain loose but not uninstruc-

* At the last Anniversary the Fellows who voted amounted to 63, while there are about 700 Fellows. I am informed, however, that usually several who are actually present do not vote.

tive analogy to the process by which your Council awards the medals. That examination is the most difficult which exists; the prize is large, and the competition is free. There is a course of mathematics, comprehending, I may say, everything; a course of physics equally large; a very large course of moral philosophy; a course of metaphysics, of logic, classics, history, chronology, and Hebrew. The examination is, of course, public; and a person of experience, acquainted with the course, can usually at the close of the examination point out the successful candidate. Some have answered better in one science, some in another, but acting under the guidance of a mature judgment, a kind of equitable adjustment has been made by the bystander, which has led him to the same conclusion as the examiners. Now, let us see for a moment how this has been brought about. The examiners, who are Fellows, are conversant to a certain extent with all the sciences; and in measuring the value of each answer, they are governed by a well-marked public opinion in the University, precisely as is the case with the enlightened audience; and they come to the same conclusion. But with your Council the case is necessarily very different. However chosen, they cannot have within themselves the same means of discharging their very difficult duties in a way which will carry with it the full concurrence of the Society. Take as an example the simplest case which can arise: two persons have been proposed for the medal, a chemist and a mathematician. Upon the Council we will presume there is a first-rate chemist and a first-rate mathematician. Now, in chemistry and in mathematics, and indeed in all the sciences, little discoveries are very abundant. By what possible means can the chemist bring his mind to bear upon the little discoveries of the mathematician, so as to weigh them, even in the roughest manner, against the discoveries in his own science? Or will the mathematician be more fortunate in dealing with the discoveries of the chemist? But how is it with respect to the other members of the Council? There will probably be gentlemen representing the different branches of the natural sciences, also perhaps a geologist, an astronomer, an engineer. Why, even in the very simple case I have supposed, the elements for the roughest approximation to a true conclusion are not within the Council, and it cannot be otherwise. The Council must therefore

travel beyond its limits for the necessary information. Individual members will naturally therefore, in an unofficial way, consult such Fellows not on the Council as are known to be conversant with the particular question at issue; and, practically, if time permitted and opportunity offered, a large proportion of the ablest Fellows would exercise a guiding influence on the Council, leading them to correct conclusions. Information would even be sought without the Society; the prevalent opinions at the Universities would be looked for, and the state of public opinion abroad in scientific circles would in many cases have great weight. I need hardly say, that as things are at present, this inquiry is impossible except to a very limited extent, and public opinion, even in our own body, can afford but little of that aid to the Council which it would do under more favourable circumstances.

If the medals were awarded in June, after discussion in several successive Councils at considerable intervals, while the great body of Fellows, the leading members of the Universities, and the foreigners who visit London, were in town, each member of the Council would have immediate access to the best sources of information. Recently the experiment has been tried of proposing candidates for the medals before the recess, but without, I think, any practical advantage. Where the candidates are numerous, inquiries would be endless; and it is only when the number has been reduced, when the doubtful questions have been put prominently forward by discussion, and a decision is imminent, that inquiries will be prosecuted with energy, and can be made with effect.

Finally, experience has shown that even in the transaction of the business of the nation, there is so much inconvenience in running counter to the habits and usages of society, that it is only in a case of necessity that Parliament is assembled in November.

With these or similar views, the subject was brought before your Council in 1845; and, as was announced by Lord Northampton, it was resolved to change the day of the anniversary to a season more generally convenient. In his Address the year after he states that doubts had arisen as to the legality of the change without a new charter, and no serious effort appears to have been subsequently made to surmount the difficulty.

I believe it is well known that Sir Humphry Davy's opinions on this subject were very similar to Lord Northampton's, and I have heard that he had deliberately committed them to paper, setting out fully his views as to the prospects of science in this country, and the position the Royal Society should hold. Such a document would be of great value, and I have anxiously inquired for it, but in vain.

This was the state of things at the time of my election as President, and after full consideration I took the first opportunity, at the anniversary in 1849, of expressing my entire concurrence in the views of Lord Northampton. It appeared to me, however, to be quite evident that there was not a strong and universal desire to change the day of the anniversary; and that was to be expected. There are certain associations, hallowed by time, to which we all recur with pleasure: when we meet on the 30th of November, our thoughts are led back to the auspicious day when the Royal Society was founded: we are reminded of Boyle, Wren, Hooke and Wallis, the first Fellows, and feel a just pride that we enjoy the high honour of being their successors. Few, perhaps, would assent without some degree of reluctance to a change which would sever these ancient associations. Feeling assured, therefore, that there were various shades of opinion, and having stated my views distinctly in my first address, I did not conceive it to be my duty to proceed further. The next step would have been, to have directed the attention of the Council to its former decision as to the expediency of changing the anniversary, and to have obtained the best advice as to the means to be taken to effect that object. I thought it better to let the matter rest for a time. Had I thought otherwise, there was certainly no one by whom such a question could have been brought forward with less propriety, or less advantage, than your President. He could not have recommended his arguments as springing from an unbiassed mind, when he was in the position, not a very agreeable one, of being necessarily absent during the autumn and winter, when there was so much business of importance. Now the case is different. There is no longer any reason for reserve, and in expressing in my last address the same opinions as in my first address, I have ventured to express them more strongly, because experience has more fully confirmed them. If we are to distribute medals, it is

surely important that the award of the medals, like the award of the Fellowships in the University of Dublin, should carry with it the full approbation of the whole Society. If we are to have meetings to transact business, it is of the highest importance to make them easily accessible to all Fellows by the choice of a suitable season, so that every person, whether on the Council or not, might have the opportunity of exercising his privileges with the least amount of personal inconvenience. It is in this way we shall render the Royal Society even more popular than it is, and hasten its growth in strength and influence, so that it will become, not the Royal Society of London merely, but the Royal Society of the whole kingdom.

I have thus ventured to suggest certain changes as to the time and manner of transacting the business of the Royal Society : the objects we have in view would, I think, be much promoted by another innovation, which it requires some courage to propose. I mean a large increase in the number of the Council. From what I have observed, I am convinced that to enable the Council to exercise an effectual supervision over all the sciences, it is necessary to make ample room, so that each science should be fully represented. There is another object perhaps of even greater importance to be attained by the same means, an *effectual representation of all classes* upon the Council, so that men of general attainments should have their place, and the government of the Society should not be exclusively entrusted to men, who, however eminent in especial branches of science, may not be always the most conversant with worldly affairs, or the most competent to transact that common-place business, upon which, in the main, the prosperity of Societies depends : nothing would do more than such a change, to promote harmony and good feeling within our walls ; nothing would contribute more to increase the influence of the Royal Society in advancing the general interests of science.

I have already ventured to say, that I had little doubt but that the memorial with its two hundred signatures in favour of juxtaposition, backed up by public opinion, would produce the desired result, and that before long we should see the leading scientific Societies under the same roof. I think I cannot now err in expressing a confident belief, that whatever changes may be required in our Society to meet the just wishes of scientific men, will be carried out with

readiness. The progress of science will thus be promoted, and this country will gradually attain even a higher place in European science than that which it at present holds. There is a new quarter, however, to which science may I think look hopefully, and that is the University of Oxford. Last session an act was passed for effecting certain improvements in the University of Oxford. Under that act a commission was appointed, consisting of men of learning and high station, to advise and cooperate with the governing body, and so effect such changes as might be useful. At present it can scarcely be said that science at Oxford receives any substantial encouragement. The fellowships are for the most part close, and therefore are not necessarily the rewards of learning; and where they are open, the success of the candidate depends upon his proficiency in the ancient languages and literature. Honours are indeed awarded to the mathematical and physical sciences, but they carry with them no emoluments; and without any knowledge of the mathematical sciences except the elements of plane geometry, and without any knowledge whatever of the physical sciences, the highest University honours may be obtained. A man therefore, after having very creditably passed a public school, and having taken his degree with a first class *in literis humanioribus*, may find that he knows no more than was known 1800 years ago. He may be ignorant of physics in its most elementary form, and may therefore be incapable of comprehending the first principles of machinery and manufactures, or of forming a just and enlarged conception of the resources of this great country. That the legislation of last session should long continue unfruitful, I think, is improbable, and the time seems to be at hand when the cultivation of the physical sciences will receive a new impulse at our universities, and when the great resources of Oxford will, in part, be applied as the rewards of scientific eminence.

You are all, Gentlemen, no doubt aware, that in 1823 your Council, at the request of the Lords of the Treasury, appointed a Committee to report upon Mr. Babbage's plan for the construction of a Calculating Machine, which he called a Difference Engine. The Committee, I need hardly say, was composed of men eminent for their theoretical and practical acquaintance with such subjects: that Committee recommended the Lords of the Treasury to assist Mr. Babbage in carrying out his undertaking. The Lords of the

Treasury acquiesced, and the work was proceeded with; Mr. Babbage exercising a constant and vigilant superintendence, furnishing the designs, making the computations, in fact supplying all the theoretical requirements, while the Government supplied the manual labour and raw materials. In the then backward state of mechanical engineering, great difficulties were encountered; at length in 1828 the Royal Society was again consulted by Government, and the result was a report from a Committee, to the effect that satisfactory progress had been made, considering the difficulties, and that the engine was likely to answer the expectations of its inventor. The Council adopted the report, and communicated it to Government, with a strong recommendation in favour of the undertaking. The Government acting under that recommendation supplied further funds, on the condition that the engine was to be public property, and the work proceeded. In 1830 the Royal Society was again consulted by Government, and the Council acting as on former occasions appointed a Committee. The report which was drawn up in a detailed form was satisfactory to the Treasury, and the Council were informed that funds would be supplied from time to time till the engine was completed. Very soon a new difficulty occurred; it became necessary to change the engineer, and it was then found that by the rules of the trade, the tools, which had been constructed at the public expense, were the private property of the engineer: there was no choice, therefore, but to sacrifice the tools, or to endeavour to effect a compromise for a large sum. The progress of the work was suspended: there was a change of government. Science was weighed against gold by a new standard, and it was resolved to proceed no further. No enterprise could have had its beginning under more auspicious circumstances: the Government had taken the initiative, they had called for advice, and the adviser was the highest scientific authority in this country;—your Council, guided by such men as Davy, Wollaston and Herschel. By your Council the undertaking was inaugurated, by your Council it was watched over in its progress. That the first great effort to employ the powers of calculating mechanism, in aid of the human intellect, should have been suffered in this great country to expire fruitless, because there was no tangible evidence of immediate profit, as a British subject I deeply regret, and as a Fellow my regret is accompanied with feelings

of bitter disappointment. Where a question has once been disposed of, succeeding Governments rarely reopen it ; still I thought I should not be doing my duty if I did not take some opportunity of bringing the facts once more before Government. Circumstances had changed, mechanical engineering had made much progress, the tools required and trained workmen were to be found in the workshops of the leading mechanists, the founder's art was so advanced that casting had been substituted for cutting in making the change wheels even of screw-cutting engines, and therefore it was very probable that persons would be found willing to undertake to complete the Difference Engine for a specific sum.

That finished, the question would then have arisen, how far it was advisable to endeavour, by the same means, to turn to account the great labour which had been expended under the guidance of inventive powers the most original, controlled by mathematics of a very high order ; and which had been wholly devoted for so many years to the great task of carrying the powers of calculating machinery to its utmost limits. Before I took any step, I wrote to several very eminent men of science, inquiring whether in their opinion any great scientific object would be gained, if Mr. Babbage's views, as explained in *Ménabrèa's* little essay, were completely realized. The answers I received were strongly in the affirmative. As it was necessary the subject should be laid before Government in a form as practical as possible, I wrote to one of our most eminent mechanical engineers to inquire whether I should be safe in stating to Government that the expense of the Calculating Engine had been more than repaid in the improvements in mechanism directly referable to it : he replied, unquestionably. Fortified by these opinions I submitted this proposition to Government :—that they should call upon the President of the Society of Civil Engineers to report whether it would be practicable to make a contract for the completion of Mr. Babbage's Difference Engine, and if so, for what sum. This was in 1852, during the short administration of Lord Derby, and it led to no result. The time was unfortunate, a great political contest was impending, and before there was a lull in politics, so that the voice of Science could be heard, Lord Derby's government was at an end.

Although, in communicating with Lord Derby, I was not acting under the directions of your Council, still, as my object was to induce the Government to complete a work in which this Society had taken so great an interest, I conceived it to be my duty to lay the facts before you, as a basis to proceed upon, should it hereafter be considered expedient to renew the subject.

I have detailed to you regularly at each anniversary the proceedings of the Committee of Recommendations ; a Committee, as you are all probably aware, appointed to distribute the grant for scientific objects which was made to us by Government the first year of my Presidency, and has since been continued annually. On the present occasion I have only to say, that since the last anniversary numerous reports have been received, and I hope the new Council will consider it expedient to collect the facts brought out, and arrange them in the form of a paper to be laid before Parliament.

With respect to the design for the re-examination of the heavens in the southern hemisphere, originally suggested by the British Association, and subsequently matured by your Council, I have only to say, as I said the last anniversary, that it is in the hands of Government.

There is no other subject which seems to me to call for observation ; the report of your Treasurer will give all necessary information as to financial matters, and it only remains for me to express the deep sense I feel of the great services which have been rendered to Science by your Councils during the six years I have been officially connected with them. I am sure nothing could have exceeded their pains-taking industry, their complete devotion to your service. In their hands your interests were watched over with anxious care, they were in perfect safe-keeping ; and when I was unavoidably absent, as was too often the case, I had no misgivings. To your Council I return my sincere thanks ; to you, Gentlemen, I feel equally grateful ; and in retiring from your Presidency permit me to assure you, that although the position I am destined henceforth to occupy will be less prominent, my exertions for the welfare of your Society shall not be less earnest.

DR. SHARPEY,

I am happy to have the honour of handing to you the Copley Medal, in charge for Professor Müller.

The Copley Medal has been awarded to our distinguished Foreign Member, Professor Johannes Müller of Berlin, for his important contributions to different branches of Physiology and Comparative Anatomy, and particularly for his researches on the Embryology and Structure of the Echinodermata, contained in a series of memoirs published in the Transactions of the Royal Academy of Berlin.

No one has borne a more conspicuous part in the advancement of physiological science for the last quarter of a century than Johannes Müller, and there is none whose services in that department of natural knowledge are more deserving of honourable recognition.

So great, indeed, has been his scientific activity, that in the brief reference to his writings suited to this occasion, I am constrained to pass by much that is excellent and confine myself to those which most strikingly evince his merit in the several departments in which he has laboured.

At an early period of his career he published his well-known treatise on the Secreting Glands. In this work he traces the intimate structure of these organs in the varied conditions which it presents, from the lowest animals to man; and in particular he establishes on a more broad and satisfactory basis the true doctrine of the relation of the blood-vessels and ducts, as first correctly conceived by Malpighi; indeed, since the time of the great anatomist of Bologna, no general work had appeared on the subject to be compared with that of Professor Müller.

Among his numerous contributions to Comparative Anatomy, I may specially single out his series of memoirs on the Myxinoid Fishes. Of the scope and importance of this great work but a faint idea is conveyed by the title; for while the anatomy of a particular family of fishes may be said to form its text, there is an ample commentary, rich in new and original matter, in which the structure is compared in other tribes, and the facts sagaciously applied to the elucidation of great questions in animal morphology.

In Physiology, Professor Müller has proved himself equally a master. His "Handbook" has long held a high place in physiological literature, and under this modest designation not only presents

clear expositions and enlightened discussions of truths already known, but is enriched throughout with the fruits of the author's own observation and experimental inquiry. Evidence of this may be found in almost every chapter, but it is sufficient to refer to his examination of the blood, to his disquisitions on the nervous system, and especially to his valuable experimental investigations on the voice and on hearing.

Professor Müller early applied himself to the study of the structure and economy of the Echinoderms. After describing, in a special memoir, the anatomy of the *Pentacrinus*, so interesting as a living representative of the extinct *Crinoidea*, and publishing, in conjunction with M. Troschel, a systematic arrangement and description of the *Asterida*, he was at length happily led to investigate the embryo life of this remarkable class of animals. The field of inquiry on which he entered had scarcely been trenched upon before, and he has since made it almost wholly his own by persevering researches carried on at the proper seasons for the last nine years, on the shores of the North Sea, the Mediterranean and the Adriatic. In this way he has investigated the larval conditions of four out of the five orders of true Echinoderms, and has successfully sought out and determined the common plan followed in their development, amidst remarkable and unlooked-for deviations in the larval organization and habits of genera even of the same order; and his inquiries respecting these animals have made us acquainted with larval forms, with relations between the larva and future being, and with modes of existence, such as nature has not yet been found to present in any other part of the animal kingdom. Finally, with the light thus derived from the study of their development, Professor Müller has subjected the organization of the entire class of Echinoderms, both recent and fossil, to a thorough revision, and has added much that is new, as well as cleared up much that was obscure, in regard to their economy, structure and homologies. It is to these researches, which occupy seven memoirs in the *Transactions of the Royal Academy of Sciences of Berlin*, that more special reference is made in the award of the Medal. Besides their other claims to distinction, they may be justly regarded as revealing a new order of facts in the history of animal development.

DR. HOOKER,

It was fortunate for natural science that you succeeded in obtaining the appointment of Naturalist to the Antarctic Expedition under Sir J. C. Ross, and that you fully availed yourself of the opportunities of pursuing your favourite studies which so frequently presented themselves during the progress of that arduous voyage.

The collections made during this voyage were extremely important, and have served as the foundation of a series of works illustrative of the botany of the Southern hemisphere. The "*Flora Antarctica*," which was commenced immediately after your return, at once established for you a high place as a philosophical botanist, by the accuracy and completeness with which each subject is treated, as well as by the importance of the physiological questions there discussed. The value of the details of a systematic work can be best appreciated by those who use it as a guide, but the essay on the structure and affinities of the curious parasite *Myzodendron*, may be noticed as perhaps the most striking of the many special topics which are there treated of.

The peculiar configuration of the Southern hemisphere, in which the land bears so small a proportion to the sea, seems at an early period to have directed your attention to Geographical Botany, and to have led you to investigate critically one of the most difficult questions of natural science, which is now acquiring that prominence to which it is so well entitled,—I mean the question of the origin and distribution of species. In your memoirs on the vegetation of the Galapagos Islands, you have brought together a great number of facts relative to insular floras, which throw much light upon this point of abstract science; and in your *Flora of New Zealand* (now in progress), you have discussed the question in all its bearings, in an essay which has attracted much attention, from the cautious and philosophical manner in which the subject is treated.

As Botanist to the Geological Survey of Great Britain, your attention was directed to the investigation of the extinct Flora; and it is evident from the essay on the carboniferous vegetation published in their Records, that you devoted yourself to this task with the same energy which had characterized your previous labours. In this essay an intimate knowledge of recent structure is applied to throw light upon the vegetation of remote periods in the history

of the globe, and there is evinced a just appreciation of facts and a cautious spirit of induction, which make it one of the most important contributions ever made by Botany to Geology.

In the selection of the Himalaya as the field of further exploration, you seem to have been guided by a sagacious perception of the requirements of natural science; and in the plain and artless narrative of that journey, we know not whether most to admire, the industry by which alone so much could have been done, the judicious selection of subjects of investigation, or the completeness of the results. On that work, geographers, geologists, meteorologists, and botanists, in fact, cultivators of all branches of natural science, have pronounced a unanimous verdict, which may be best summed up in the words of the illustrious Humboldt, the greatest of scientific travellers, as "a perfect treasure of important observations, in which a prodigious extent of previous knowledge is brought to bear upon every topic, and which is marked with great sagacity and moderation in all the views brought forward."

DR. HOFMANN,

A Royal Medal has been awarded to you, "for your Memoirs on the molecular constitution of the Organic Bases, contained in the Philosophical Transactions, and the Transactions of the Chemical Society."

The long series of researches which are acknowledged in the present award, were commenced by your inquiries, published in 1844, on the volatile bases contained in coal-gas naphtha, in which you recognized aniline, a base previously obtained from indigo, and leucoline, likewise derived from the decomposition of quinine, cinchonine, and strychnine. In consequence of its extremely definite character, aniline was selected by you as the type of volatile bases, and investigated in all directions, with singular perseverance and success. A variety of new compounds were thus obtained, bearing a fixed relation to the primitive body, such as chloraniline, bromaniline, nitraniline, melaniline, &c. From these researches, and the facts supplied by other investigators, you were gradually led to a conception of the common constitution of this class of compounds, and obtained the means of producing substances of a similar constitution to an almost unlimited extent. Oxide of am-

monium is the general prototype, the hydrogen of that volatile base being replaced to the extent of one, two, three, or four equivalents, by a multitude of elementary and compound radicals. Your method, also, of introducing these radicals into the constitution of ammonia, by the agency of the bromides and iodides of the radicals, has been found to admit of extensive application, and has very materially assisted in the general progress which organic chemistry has made since this method was made public.

DR. NEIL ARNOTT,

I have much pleasure in announcing, that a Rumford Medal has been awarded to you, "for your construction of a new Smoke-consuming and Fuel-saving Fire-place, with accessories, ensuring the healthful warming and ventilation of houses, lately described in the *Journal of the Society of Arts* (May 12, 1854), and for your various contributions to the elucidation of the principles and improvement of the practice of heating and ventilation."

The President then called upon Dr. Sharpey to read the following obituary notices of some of the deceased Fellows :—

EDWARD FORBES.—In the melancholy list of those who have passed away from among the Fellows of this Society, there is no name whose mention will awaken a more general and profound feeling of regret than that of EDWARD FORBES. Some leave us full of years and honours, their work in this world finished, and its rewards enjoyed ; the sphere of action of others has been so limited, that their absence is felt within only a narrow circle ; but in Edward Forbes we have to lament one whose vigorous intellect had but just attained the ripeness of the prime of life ; who, after rising with almost unexampled rapidity to the height of his ambition, sank within sight of a future more brilliant than his past ; and whose loss to the brethren in science who looked up to him, to the University whose hopes were centred in him, and to the friends of all classes and pursuits who loved him, is truly irreparable.

A native of the Isle of Man, and born in the year 1815, Edward Forbes exhibited at a very early age that aptness for and attach-